

Year 2 Mathematics Objectives 2014-15

Programme of study	Non Statutory guidance	Objectives
<p>Number and place Value</p> <ul style="list-style-type: none"> Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward Recognise the place value of each digit in a two-digit number (tens, ones) Identify, represent and estimate numbers using different representations, including the number line Compare and order numbers from 0 up to 100; use <, > and = signs Read and write numbers to at least 100 in numerals and in words Use place value and number facts to solve problems. 	<p>Using materials and a range of representations, pupils practise counting, reading, writing and comparing numbers to at least 100 and solving a variety of related problems to develop fluency. They count in multiples of three to support their later understanding of a third.</p> <p>As they become more confident with numbers up to 100, pupils are introduced to larger numbers to develop further their recognition of patterns within the number system and represent them in different ways, including spatial representations.</p> <p>Pupils should partition numbers in different ways (for example, $23 = 20 + 3$ and $23 = 10 + 13$) to support subtraction. They become fluent and apply their knowledge of numbers to reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers. They begin to understand zero as a place holder. .</p>	<p>Counting</p> <ul style="list-style-type: none"> To count in multiples of 2's,3's and 5's from 0. Forward and backward. To count in multiples of 2's,3's and 5's from any number. To make estimates. <p>Comparing numbers</p> <ul style="list-style-type: none"> To order numbers to 100 (position on numberline and 100 square) To find and position numbers on a numberline or 100 square. Use <> and = to compare numbers. <p>Identifying presenting and estimating numbers</p> <ul style="list-style-type: none"> To make estimates. To show numbers using equipment To show numbers using 10s and 1s To position numbers on a numberline. <p>Reading and writing numbers</p> <ul style="list-style-type: none"> To read and write numbers to 100 in numerals and words, <p>Place value</p> <ul style="list-style-type: none"> To know what each digit in a number represents in a 2 digit number. To partition numbers in different ways (for example, $23 = 20 + 3$ and $23 = 10 + 13$) <p>Solving problems</p> <ul style="list-style-type: none"> To solve problems involving place value.
<p>Addition and subtraction</p> <ul style="list-style-type: none"> Solve problems with addition and subtraction: Using concrete objects and pictorial representations, including those involving numbers, quantities and measures 	<p>Pupils extend their understanding of the language of addition and subtraction to include sum and difference.</p> <p>Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to</p>	<p>Number bonds</p> <ul style="list-style-type: none"> To know addition and subtraction bonds to 20. To know addition and subtraction bonds of multiples of 10 to 100.

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<ul style="list-style-type: none"> • Applying their increasing knowledge of mental and written methods • Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <ul style="list-style-type: none"> - A two-digit number and ones - A two-digit number and tens - Two two-digit numbers - Adding three one-digit numbers • Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. 	<p>calculate $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$). This establishes commutativity and associativity of addition.</p> <p>Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.</p>	<ul style="list-style-type: none"> • To derive and use related facts up to 100 <p>Mental calculation</p> <ul style="list-style-type: none"> • Addition and subtraction of <ul style="list-style-type: none"> - A two-digit number and ones - A two-digit number and tens - Two two-digit numbers - Adding three one-digit numbers <ul style="list-style-type: none"> ➢ Reorder when adding ➢ Use knowledge of pairs making ten. ➢ Partition and combine multiples of tens and ones. ➢ Partition : count on or back in tens and ones to find total or difference ➢ Bridge through 10 <p>Written methods</p> <ul style="list-style-type: none"> • To develop a written method for adding and subtracting (supported by equipment). • To understand that addition can be done in any order and that subtraction can not <p>Inverse operations, estimating and checking answers</p> <ul style="list-style-type: none"> • To check answers using inverse operations. • To find missing numbers (using knowledge of inverse e.g I know $11+9=20$ so $20- ? = 9$) <p>Solving problems</p> <ul style="list-style-type: none"> • To solve one-step addition and subtraction problems in a range of contexts. (practically and pictorially) <ul style="list-style-type: none"> ➢ To describe a puzzle or problem (acting out, draw a diagram, using equipment, telling a partner)
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<p>Multiplication and division</p> <ul style="list-style-type: none"> • Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. 	<p>Pupils use a variety of language to describe multiplication and division. Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, $40 \div 2 = 20$, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, $4 \times 5 = 20$ and $20 \div 5 = 4$).</p>	<p>Multiplication and division facts</p> <ul style="list-style-type: none"> • To recall multiplication and division facts for 2,5 and 10 multiplication tables. • To recognise multiples of 2, 5 and 10. • To recognise odd and even numbers. • To make connections between tables. • To count in steps of 2s,3s and 5s from 0 and any number. <p>Mental calculation</p> <ul style="list-style-type: none"> • To use maths words and symbols to describe multiplication and division (sets of, equal groups, arrays, divide, multiply) • To understand that halving is division by 2 and doubling is multiplication by 2. • To double and halve multiples of 10 • To double and halve 2 digit numbers. <p>Written methods</p> <ul style="list-style-type: none"> • Read, write and calculate mathematical statements using \div, \times and $=$ • To multiply by adding several sets of the same number. • To divide by subtracting sets of the same amount • To represent number as several sets of the same amount (using equipment such as numicon, on numberlines, arrays) • To understand that multiplication can be

		<p>done in any order and that division can not.</p> <p>Solving problems</p> <ul style="list-style-type: none"> • To solve simple multiplication and division problems in a range of contexts (practically and pictorially) <ul style="list-style-type: none"> ➤ To describe a puzzle or problem (acting out, using equipment, telling a partner) ➤ To use equipment and objects to show my thinking. ➤ To record my calculation using symbols. ➤ To show how I have solved a problem. ➤ Set the solution in the context of the problem.
<p>Fractions</p> <ul style="list-style-type: none"> • recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity • write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$. 	<p>Pupils use fractions as ‘fractions of’ discrete and continuous quantities by solving problems using shapes, objects and quantities. They connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes. They meet $\frac{3}{4}$ as the first example of a non-unit fraction. Pupils should count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line (for example, $1\frac{1}{4}$, $1\frac{2}{4}$ (or $1\frac{1}{2}$), $1\frac{3}{4}$, 2). This reinforces the concept of fractions as numbers and that they can add up to more than one.</p>	<p>Counting in fractional steps</p> <ul style="list-style-type: none"> • To count in fractions (halves and quarters) up to 10 • To position fractions on a numberline. <p>Recognising fractions</p> <ul style="list-style-type: none"> • To write and name fractions. • To understand that fractions are equal parts of a whole. • To find fractions unit fractions (of shapes, measures, objects, quantities) • To find $\frac{3}{4}$ (of shapes, measures, objects, quantities) <p>Equivalence</p> <ul style="list-style-type: none"> • To find equivalent fractions. <p>Solving problems involving fractions</p> <ul style="list-style-type: none"> • To solve simple practical problems involving fractions in a range of contexts.

<p>Measurement</p> <ul style="list-style-type: none"> • choose and use appropriate standard units to estimate and measure to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels <ul style="list-style-type: none"> ➤ length/height in any direction (m/cm); ➤ mass (kg/g); ➤ temperature (°C); ➤ capacity (litres/ml) • compare and order lengths, mass, volume/capacity and record the results using >, < and = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time • tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour and the number of hours in a day. 	<p>Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system. They use the appropriate language and record using standard abbreviations. Comparing measures includes simple multiples such as 'half as high'; 'twice as wide'. They become fluent in telling the time on analogue clocks and recording it. Pupils become fluent in counting and recognising coins. They read and say amounts of money confidently and use the symbols £ and p accurately, recording pounds and pence separately.</p>	<p>Comparing and estimating</p> <ul style="list-style-type: none"> • To compare and describe lengths/mass/capacity/ time (using simple multiples – twice as long, half as high) • To order lengths, mass, capacity, temperatures. • To record results using symbols >, < and = • To order times. • To compare times (how much later/earlier) • <p>Measuring and calculating</p> <ul style="list-style-type: none"> • To measure to the nearest appropriate unit length/height (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) • Use appropriate measuring equipment. • To recognise and use symbols for £ and p. • To combine coins and notes to make a given value. • To calculate change. <p>Telling the time</p> <ul style="list-style-type: none"> • To tell, show and write the time (to 5 minutes, quarter to and quarter past) <p>Converting</p> <ul style="list-style-type: none"> • To know how many minutes in an hour and hours in a day <p>Solving problems To solve practical problems (involving the measuring of lengths, heights, mass/weight capacity, temperature and time and money)</p> <ul style="list-style-type: none"> ➤ To decide which operation to use. ➤ To use mathematical symbols to show my thinking.
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<p>Shape and space</p> <ul style="list-style-type: none"> • Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line • Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • Identify 2-D shapes on the surface of 3-D shapes [for example, a circle on a cylinder and a triangle on a pyramid] • Compare and sort common 2-D and 3-D shapes and everyday objects. 	<p>Pupils handle and name a wide variety of common 2-D and 3-D shapes including: quadrilaterals and polygons, and cuboids, prisms and cones, and identify the properties of each shape (for example, number of sides, number of faces). Pupils identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces.</p> <p>Pupils read and write names for shapes that are appropriate for their word reading and spelling.</p> <p>Pupils draw lines and shapes using a straight edge.</p>	<p>Identifying shapes and their properties</p> <ul style="list-style-type: none"> • To name 2D and 3D shapes. • To visualise and describe 2D and 3D shapes. • To draw shapes using straight lines. • . • To find lines of symmetry in a vertical line. • To identify the properties of 2D and 3D shapes (practically) • To explore how 3D shapes are made from 2D shapes. • To use precise vocabulary related to shapes. <p>Comparing and classifying</p> <ul style="list-style-type: none"> • To sort and classify shapes <p>Solving problems</p> <ul style="list-style-type: none"> • To solve shape problems in a range of contexts.
<p>Position and direction</p> <ul style="list-style-type: none"> • order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise). 	<p>Pupils should work with patterns of shapes, including those in different orientations.</p> <p>Pupils use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (for example, pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles).</p>	<p>Position, direction and movement</p> <ul style="list-style-type: none"> • To describe position on a grid • To describe direction. (forwards, backwards, left, right, clockwise and anti-clockwise) • To recognise right angles. • To make whole, half, quarter and three quarter turns. (clockwise and anticlockwise) and their equivalence, e.g 2 quarter turns make a half turn. <p>Solving problems</p> <ul style="list-style-type: none"> • To solve practical problems using position

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